

REMARKS

Applicants request reconsideration and allowance of the present application in view of the remarks below.

Claims 57-77 and 83 remain pending for consideration, including independent claim 57. Applicants confirm the provisional election made during a telephone conversation with Examiner on 5/15/2009 of Group 1, claims 57-77. Accordingly, claims 78-82 have been withdrawn from consideration. In the present Amendment, claims 57 and 59 have been amended and claim 58 have been canceled. Additionally, a new claim, claim 83, is being presented for consideration.

In the Office Action, Claims 57, 60-62 and 64-66 were rejected under 35 U.S.C. 103(a) as being obvious over U.S. Patent No. 6,284,135 to Ookata et al in view of U.S. PGPub 2003/0080054 to Chuang et al. Claims 58-59, 67-68, 73-75 and 77 were rejected under 35 U.S.C. 103(a) as being obvious over Ookata et al in view of Chuang et al and U.S. Patent No. 6,843,908 to Okajima et al. Claim 63 was rejected under 35 U.S.C. 103(a) as being obvious over Ookata et al in view of Chuang et al as evidenced by U.S. Patent No. 5,690,864 to Tyer. Claim 69 was rejected under 35 U.S.C. 103(a) as being obvious over Ookata et al in view of Chuang et al and Okajima et al as evidenced by U.S. Patent No. 6,808,828 Chang et al. Claims 70-72 were rejected under 35 U.S.C. 103(a) as being obvious over Ookata et al in view of Chuang et al and Okajima et al as evidenced by U.S. Patent No. 5,536,404 to Drewery. Finally, claim 76 was rejected under 35 U.S.C. 103(a) as being obvious over Ookata et al in view of Chuang et al, Okajima et al and U.S. Patent No. 4,940,550 to Watson.

Applicants respectfully traverse the rejection of presently amended claim 57, which has been amended to include the limitations of claim 58 and to clarify the location of the vertically oriented sieve with respect to the horizontally oriented sieve. Applicants submit that the only incentive or motivation for modifying Ookata et al using the teachings of Okajima et al and Chuang et al in the manner suggested in the Office Action results from the Applicants' disclosure as a blueprint to reconstruct the claimed invention out of isolated teachings in the prior art, which is improper under 35 U.S.C. § 103. Thus, as there is not a proper motivation to modify Ookata et al using the disclosures of Chuang et al and Okajima et al, Applicants submit that amended claim 57 patentably defines over the prior art.

Independent claim 57 now requires, among other things, a vertically oriented sieve at the wastewater infeed of the membrane module, wherein the vertically oriented sieve is located between the horizontally oriented sieve and the filter plates. As described in the present application:

[0009] The flow will be particularly favorably enhanced if the sieve for the wastewater feed is placed above the sieve used for the inlet of air. In this way, a flow is obtained which reinforces the feed of wastewater and advantageously supports the continuous flow of wastewater across the filter plates and aids the passage of the permeate through the filter plates.

[0010] If the sieve for the feed of wastewater is positioned essentially vertically and the sieve for the inlet of air is conversely horizontal, then, first, the apportionment action of the air and second the turbulent flow of the wastewater feed is particularly well supported.

As acknowledged by Examiner, both Ookata et al and Chuang et al fail to disclose a vertically oriented sieve at the wastewater infeed of the membrane module. To account for this deficiency, Examiner indicated that Okajima et al discloses a

vertically oriented wastewater inlet 50 in which it would have been obvious to include the sieve of Chuang et al at a vertical orientation to avoid clogging of the membranes. Relying on this, Examiner concluded that it would have been obvious to one of ordinary skill in the art to modify the wastewater infeeds of Chuang et al and Ookata et al to include the vertically oriented wastewater inlet of Okajima et al.

Okajima et al discloses a multi-stage immersion separator that includes both an upper and lower set of filter plates or plate-like membrane cartridges 26. (See Okajima et al, column 11, lines 48-50 and Fig. 7). A vertically oriented inlet 50 in the filtration part 23 (or membrane module) allows wastewater to flow from the surrounding tank to an open space 48 in the filtration part 23 between the upper and lower sets of filter plates 26. (See Okajima et al column 12, lines 48-63). Such an inlet is necessary, as specifically disclosed Okajima et al, to compensate for the reduction in flow due to the membrane action of the lower set of filter plates 26 and to also dilute the sludge concentration that had been increased in the crossflow between the lower set of filter plates 26. (See Okajima et al column 12, lines 1-7). Examiner indicated that these rationales provided the motivation to modify the wastewater infeeds of Ookata et al and Chuang et al to include such a vertically oriented wastewater inlet.

Applicants respectfully submit that a person of ordinary skill in the art would not be motivated to modify Ookata et al to include a vertically oriented wastewater inlet in order to compensate for reduced flow due to a lower set of filter plates. Specifically, Ookata et al discloses an apparatus with only one set of filter plates or membrane elements 51 and thus would not need to compensate for a reduced flow due to lower membrane elements. (See Ookata et al, column 5, lines 9-17). Moreover, even if there

was a reduction of flow within the membrane unit 50, Ookata et al discloses that air sources L3, L4, and L5 comprise regulating valves 63, 77, and 78, respectively, which allow the flow rate of the air and wastewater passing through the membrane elements 51 to be increased or decreased as needed. (See Ookata et al column 5, lines 50-61 and column 6, lines 57-67). Similarly, as Ookata et al does not disclose multiple sets of filter plates, one would not modify Ookata et al to include a vertically oriented wastewater inlet to dilute increased sludge concentration flowing from a lower set of filter plates.

Furthermore, since the membrane elements 51 of Ookata et al extend vertically throughout the entire membrane unit 50 (See Ookata et al, column 5, lines 13-17 and Fig.3), the vertically oriented wastewater inlet 50 of Okajima et al would not function properly if installed in Ookata et al. Specifically, in Okajima et al, the inlet 50 is spaced a predetermined length L from the bottom portion of the upper set of filter plates 26. (See Okajima et al, column 11, lines 52-57 and Fig. 7). Although the specification does identify the rationale behind such spacing, it seem clear that it is necessary to allow the wastewater flowing into the open space 48 through inlet 50 to sufficiently mix with the air and wastewater flowing from the lower set of filter plates 26 across the width of the filtration part 23 prior to the mixture rising into the upper set of filter plates 26. Such spacing is not available in Ookata et al, as the disclosure indicates that the membrane elements 51 form the bottom end S1 of the membrane unit 50. Thus, if a vertically oriented wastewater inlet was installed in the membrane unit 50 of Ookata et al, the wastewater flowing into such inlet would not distribute across the width of the membrane unit 50 prior to rising upward through the membrane elements 51 due to the

air flowing from the aerator 61. This would have the effect of limiting the efficiency of the apparatus disclosed in Ookata et al, as the bottom portions of the membrane elements 51, located opposite from the vertically oriented wastewater inlet, would not be supplied with a flow of wastewater. Accordingly, Applicants submit that there would be no motivation for one of ordinary skill in the art to modify Ookata et al to include the vertically oriented wastewater inlet 50 of Okajima et al.

Additionally, Applicants submit that one of ordinary skill in the art would not modify Chuang et al to include the vertically oriented wastewater inlet of Okajima et al. Unlike Ookata et al and Okajima et al, which are directed to open system wastewater treatment devices submerged in a wastewater tank, Chuang et al discloses a closed system apparatus in which wastewater is supplied directly into the treatment apparatus by way of a pipe 3. (See Chuang et al paragraph 0012 and Fig. 1). Particularly, wastewater is pumped into (as opposed to flowing in from the tank) a lower portion 40 of the apparatus where it is mixed with air and rises through a supporting plate 9 (which operates as the wastewater infeed in the membrane module) to the reactor 32. (See Chuang et al paragraph 0015) Thus, Chuang et al, by its very nature, could not be modified to include a vertically oriented wastewater inlet in its reactor 32.

Moreover, even assuming that it would have been obvious to modify the references as suggested by Examiner, Applicants submit that the combination of Ookata et al, Chuang et al and Okajima et al would still not teach or suggest all the claimed limitations of amended claim 57. Specifically, claim 57 has been amended to not only include the limitations of claim 58, but to also clarify the position of the vertically oriented sieve with respect to the horizontally oriented sieve. In that respect, claim 57

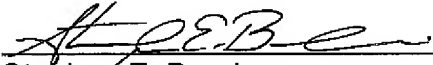
requires that the vertically oriented sieve be located between the horizontally oriented sieve and the filter plates. As shown in Fig. 3 of the present application, the vertically oriented sieve 110 forms a sidewall for the space located between the horizontally oriented sieve 108 and the bottom end of the schematically illustrated filter plates 113. As indicated above, Ookata et al does not disclose such spacing, as the membrane elements 51 extend vertically from the bottom end S1 of the membrane unit 5-. Accordingly, a vertically oriented wastewater inlet installed in the membrane unit 50 of Ookata et al and fitted with a corresponding sieve could not be located between a horizontally oriented sieve and the filter plates or membrane elements 51.

In summary, Applicants submit that amended claim 57 patentably defines over the cited references. There would be no motivation to modify Ookata et al in the way suggested by Examiner except by using the present application, as improper hindsight, to provide such motivation. Moreover, even if Ookata et al was modified as suggested, the combination would still fail to teach or suggest all of the claimed limitations of amended claim 57.

For at least the reasons discussed above, Applicants respectfully assert that the claims patentably define over the cited references. As such, it is believed that the present application is in complete condition for allowance and favorable action, therefore, is respectfully requested. Should any issues remain after consideration of this amendment, then Examiner Christian is invited and encouraged to telephone the undersigned. Please charge any additional fees required by this Amendment to Deposit Account No. 04-1403.

Respectfully submitted,

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